ACS LED SIGNALLING UNIT

LINEAR SENSOR CALIBRATION

AS-i module / multi-voltage modules version

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GENERAL

The module has two operating modes:

- Normal mode: this mode displays the status of inputs and outputs by default.

- Configuration mode: this mode is used for calibrating the sensor with the valve, and for enabling or disabling the lower plug opening, valve closed and valve open retro data functions.

A learning phase must be performed for the sensor to memorize the operating positions of the associated valve. This learning can be performed manually or by an automatic cycle. These positions corresponding to the retro data can be inhibited.

Notes:

- The valve equipped with its signalling unit has been calibrated ex-works. The lower plug, valve closed and valve open retro data are not inhibited.

- Since the retro data LEDs are substantially diffusive, it is recommended not to look directly into the diffusion beam, otherwise there will be a risk of dazzling.
  In order to reduce this risk, the diffusion of the LEDs reduces in intensity in calibration mode.

LOCKING/UNLOCKING THE KEYBOARD

A keyboard locking facility has been provided in order to access the signalling unit calibration and avoid any possible incorrect adjustment.

The keyboard is locked and unlocked **by simultaneously holding down the** *Mode pushbutton* and *Set pushbutton*.
- LED (B) (red) flashes for around 5 seconds.
The keyboard is locked.
- LED (A) "Pwr" flashes for around 5 seconds.
The keyboard is unlocked.

In the event of a loss of electric power during a calibration, the keyboard is automatically locked when power is resumed.
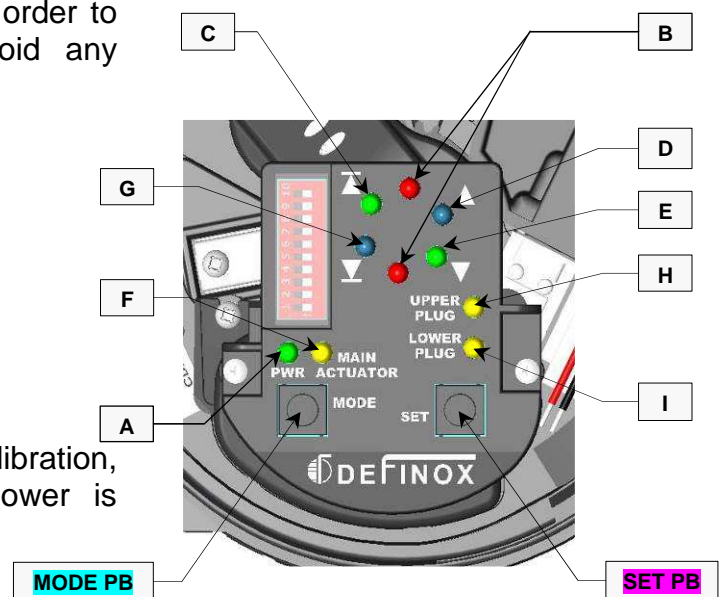
CALIBRATION

- ⌾ *Enter configuration mode:*
  This allows the calibration to be controlled by manually activating the different solenoid valves before locking the module for process use.
  Hold down *Mode pushbutton*.
  LEDs G, E and D illuminate and LEDs A and B flash.

- ⌾ *Enter the calibration function:*
  Briefly press *Mode pushbutton*.
  LEDs *G, E, D flash.*
  A flashing Power LED (A) and a flashing LED (B) indicate that calibration is enabled.

MANUAL CALIBRATION FACILITY:

◉ *__Manual calibration:__*

Briefly press *Set pushbutton*.

LED G (▼) is illuminated and the 1st calibration can then be carried out.

➔ *__Lower plug calibration:__*
  LED G (▼) is illuminated to indicate that calibration is being carried out on the lower plug function.
  Enable solenoid valve EV3 via the manual pulse control (hold down).
  − **Briefly press the** *Set pushbutton* to store the position.
  − **Hold down** *Set* to disable the PLC and lighting retro data.
  Disable solenoid valve EV3 via the manual pulse control.

➔ *__Valve closed calibration:__*
  LED G (▼) goes out, and LED E (▲) illuminates, indicating that calibration is being carried out on the valve closed function.
  Enable solenoid valve EV2 via the manual pulse control (hold down).
  − **Briefly press the** *Set pushbutton* to store the position.
  − **Hold down** *Set* to disable the PLC and lighting retro data.
  Disable solenoid valve EV2 via the manual command.

➔ *__Valve open calibration:__*
  LED E (▼) goes out, and LED D (▲) illuminates, indicating that calibration is being carried out on the valve open function.
  Enable solenoid valve EV1 via the manual pulse control (hold down).
  − **Briefly press the** *Set pushbutton* to store the position.
  − **Hold down** *Set* to disable the PLC and lighting retro data.
  Disable solenoid valve EV1 via the manual command.

➔ *LEDs G, E and D will be illuminated or flashing according to the functions that are enabled.*
  − LED continuously illuminated = the PLC and lighting retro data are enabled.
  − LED flashing = the PLC and lighting retro data are disabled.

➔ *__Exiting the calibration function:__*
  Hold down Mode pushbutton.
  Configuration mode is then resumed:
  • the calibration can be checked again by enabling the different solenoid valves.
  • the module can be locked for a process use.

➔ *__Not to forget locking the keyboard__*.
  Simultaneously holding down the *Mode pushbutton* and *Set pushbutton.*
  − LED (B) (red) flashes for around 5 seconds.
  − The keyboard is locked.
  − LEDs in pair are maximum intensity.

AUTOMATIC CALIBRATION FACILITY:

◎ ***Automatic calibration:***

Hold down *Set pushbutton*.

LEDs B, C, D, E and G illuminate successively in the form of a chase and the automatic calibration cycle starts up.

The module will automatically begin the calibration of the lower plug, followed by the calibration of the closed valve, and finishing with the calibration of the open valve.

At the end of this sequence, the module will reiterate these calibrations in order to check the positions.

Once the automatic calibration cycle has been completed, the module waits for the operator to confirm or otherwise the enablement of the retro data.

– **Briefly press** **Set pushbutton**: validates the position and enables the retro data.
– **Hold down Set**: disables the retro data.

This confirmation must be carried out three times: once for the lower plug, once for the closed valve and once for the open valve. The transition from one to the other takes place automatically.

On the final confirmation, automatic switchover to the synthesis of the PLC and lighting retro data takes place automatically.

➔ *LEDs G, E and D will be illuminated or flashing according to the functions that are enabled.*
  – LED continuously illuminated = the PLC and lighting retro data are enabled.
  – LED flashing = the PLC and lighting retro data are disabled.
  –

➔ ***Exiting the calibration function:***
  Hold down *Mode pushbutton*.
  Configuration mode is then resumed:
  • the calibration can be checked again by enabling the different solenoid valves.
  • the module can be locked for a process use.

➔ ***Not to forget locking the keyboard***.
  Simultaneously holding down the *Mode pushbutton* and *Set pushbutton*.
 – LED (B) (red) flashes for around 5 seconds.
  – The keyboard is locked.
  – LEDs in pair are maximum intensity.

## RESULT OF THE CALIBRATION OF A LINEAR SENSOR AFTER MODULE LOCKING

The results below correspond to the choice of retro data colours*, giving the following situations for each valve status:

* results presented in correlation with colours parameterised ex-works, with no inhibition of the PLC and/or lighting retro data.

LINEAR SENSOR CALIBRATION STANDARD

PLC retro data / Valve status	Valve closed (I1)	Valve open (I2)	Lower plug (I4)	Upper plug (I3)
Valve closed	1			
Valve open		1		
Lower plug enabled	1		1	
Upper plug enabled	1			1
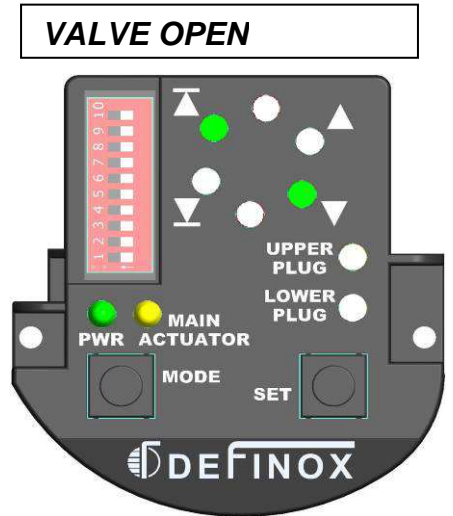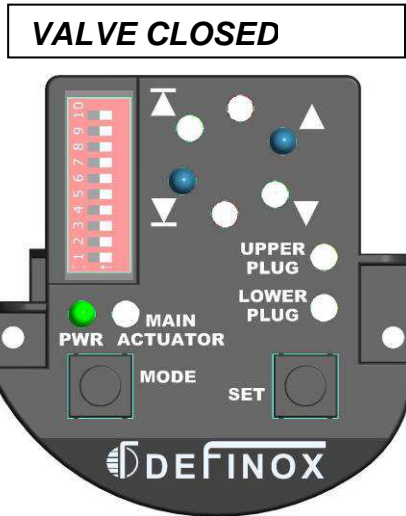
LINEAR SENSOR CALIBRATION STANDARD

Lighting retro data / Valve status	Valve closed (I1)	Valve open (I2)	Lower plug (I4)	Upper plug (I3)
Valve closed	1			
Valve open		1		
Lower plug enabled			1	
Upper plug enabled				1

VALVE CLOSED

VALVE OPEN

UPPER PLUG ENABLED

LOWER PLUG ENABLED
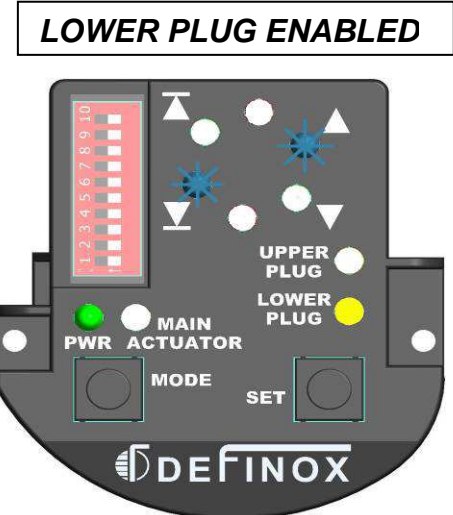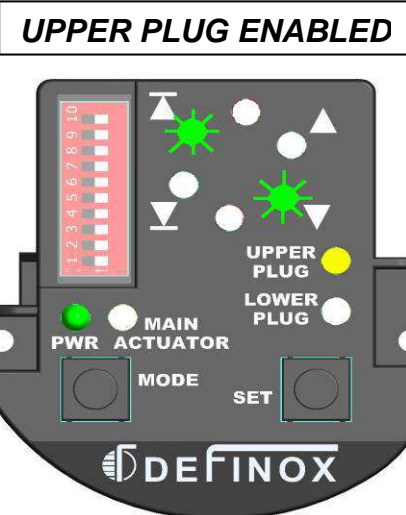
POSSIBLE FAULTS DURING CALIBRATION

The descriptions of the different faults that may occur are given below, indicated by the module via the LEDs.

CALIBRATION ERROR

All the LEDs of the UPLED flash.

- Hold down **Set** to acknowledge the fault.
- The values recorded are inconsistent or outside the operating range of the linear sensor, check for air on the ACS unit and on the valve.
- Check the electrical and pneumatic operation of the solenoid valves.
- Repeat the calibration.

NO SIGNAL FROM THE LINEAR SENSOR

LED A (PWR) is illuminated, all the yellow LEDs F, H and I (main actuator, upper plug and lower plug) flash, as well as LEDs C, D, E and G.

- Check that the Power LED on the linear sensor is illuminated.
- Check the connection between the linear sensor and the electronic module.
- Use a voltmeter to check that the voltage between terminals V+ and V- on the sensor side of the terminal is between 20 and 24 V DC.
- If the voltage and the wiring are OK and the sensor Power LED is extinguished then replace the sensor.

CAM OUT OF DETECTION RANGE

LED A (PWR) is illuminated, yellow LEDs F flash, H and I (main actuator, upper plug and lower plug) flash. The green power LED on the linear sensor flashes.
- Check that the detection cam is installed on the valve.
- Check the position of the cam in the linear sensor.

REMINDER OF ACS UNIT AIR CONNECTIONS - LOCATION OF SOLENOID VALVES

		VERSION 1 EV		VERSION 3 EV	
		ACS without SV	ACS 1EV	ACS 2EV	ACS 3EV
Pressure	Unit connection		P	P	P
Pierced cap outlet	Unit connection		E	E	E
Main actuator	Unit connection		①	①	①
	Solenoid valve		EV1	EV1	EV1
Upper plug opening	Unit connection			②	②
	Solenoid valve			EV2	EV2
Lower plug opening	Unit connection		②		③
	Solenoid valve		EV2		EV3
1/8" plastic cap		P,①,E	③	③	

Green Power LED